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| AUTHOR | Wolfe, Nancy |
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ABSTRACT

Examines if the matriculation services offered by City College of San Francisco (California), including orientation, counseling, and assessment, were making a difference in the success and/or retention of students. Seeks answers to three questions using data gathered on students' participation in the matriculation process: (1) are students required to go through the matriculation process actually participating in the service; (2) do matriculation services provided improve students' success and/or retention during their first semester; and (3) are there significant differences in student characteristics between students who receive matriculation services and those who do not? Finds that more than 23% of the fall 1995 students were not listed in the matriculation extract. Matriculation services were found to have a positive effect on students if they were taking more than nine units; they also end up taking classes that fit their ability. Students receiving matriculation services tend to get more "B," "C," and "D" grades. Non-participating students have more grade extremes ("A" and "F"). Students who took nine or fewer units and did not receive matriculation services had a slightly higher GPA than those who did receive services. Student age is significantly related to whether a student received matriculation services. Significant differences were found among racial and ethnic groups. Discusses implications and future research. (VWC)

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ED 445 744

# THE IMPACT OF MATRICULATION ON STUDENTS AT CITY COLLEGE OF SAN FRANCISCO

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A Joint Research Project of the
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Office of Matriculation and Assessment

January 1998



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**DEDICATED TO JEAN MCTYRE**
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During the 1995/96 academic year, Jean McTyre, then dean of Matriculation and Assessment, proposed a joint project with the Office of Research, Planning and Grants to investigate the impact of matriculation services upon CCSF students. Dr. Steven Spurling, a research consultant was hired to conducted a series of studies on the impact of matriculation upon CCSF students. The first study was completed in October 1996. Based upon that study, this report summarizes the first of four research studies on matriculating CCSF students. Dr. Nancy Wolfe of the Office of Research, Planning and Grants wrote this report.

## INTRODUCTION

Students entering community colleges are more likely to be successful if they can match their skill levels with appropriate courses and course sequences. This fit between student skills and course rigor is especially important in the key gateway programs of English, English as a Second Language and Mathematics. Helping students to make the appropriate choices has been an on-going challenge for the community colleges where diversity of student skills is the widest range among all postsecondary institutions. Students entering college for the first time are at the greatest risk of dropping out without meeting their goals.

To address the needs of new and readmitted students, the Community College Matriculation Act (1985) provides special categorical funding for student support services to each community college in the state. These services target students in credit programs only[1]; City College of San Francisco currently receives approximately $1.3 million dollars annually for services for credit students. The services include the following:[2]

a) the processing of applications for admission
b) orientation and pre-orientation services
c) assessment services
d) counseling or advisement
e) assistance in developing a student educational plan
f) post-enrollment evaluation of student's progress
g) referrals to support services and specialized curriculum

While City College of San Francisco students are given ample time to avail themselves of assessment, orientation and counseling services (from April through September for fall term, and from November through February for spring term—at all campuses), we had questions about the effectiveness of these services. This study was commissioned to find out if the services offered by the college were making a difference in the success and/or retention of students. Are matriculation services providing the necessary assistance for students to be successful? Do students lacking these services do as well?

## PURPOSE OF THIS REPORT

This report is based upon a study completed by Dr. Steven Spurling, a research consultant, for the Office of Matriculation and Assessment, and the Office of Research, Planning and Grants during Fall 1996[3]. It seeks answers to three major questions using data gathered on students' participation in the matriculation process. For purposes of this study, matriculation has been defined as participation in assessment, orientation and counseling. The three questions are as follows:

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[1] Recent legislation authorizes additional funds for non-credit matriculation services.

[2] California State Education Code 55520 Required Services (State Matriculation Regulations, Chapter 2. Community College Standards, Subchapter 1. Minimum Conditions) 11/93, p13-14.

[3] Copies of the report entitled "Matriculation at the City College of San Francisco, Fall 1995" (October 10, 1996) are available in the Office of Matriculation and Assessment, and the Office of Research, Planning and Grants.

1. Are the students who are required to go through the matriculation process actually participating in the service?
2. Do the matriculation services provided improve students' success and/or retention during their first semester of attendance at school?
3. Are there significant differences in student characteristics (i.e. age, gender, ethnicity) between students who receive matriculation services and those that do not?

A number of cautionary notes need to be stated before reading this study. First, this study examines one semester of data ( Fall 1995) and therefore broad conclusions should not be made until further data is examined. Second, the study was initiated only as a first attempt at viewing the efficacy of data in the matriculation database. Given the usefulness of the matriculation database, further studies will be conducted during the next few years.

**MATRICULATION AT CITY COLLEGE**

At CCSF all new and readmitted students are required to participate in the matriculation process, but may, under certain circumstances, be exempted from various matriculation services. In order to be considered for exemption, students must have either 1) already earned an A.A./A.S. degree or higher (U.S. accredited institutions only); or 2) stated that their plan is to enroll in nine or fewer units with no prerequisites **and** will not enroll in any math, English, or ESL courses. They also must state that they do not plan to earn a degree or certificate from City College or to transfer to a baccalaureate institution.

For purposes of this report, students who receive at least two out of the three matriculation services (orientation, counseling, and assessment) are considered to be "matriculated students" and will be compared with students who receive no matriculation services. Students are considered to be "exempt students" if they have received exemptions for at least two matriculation services. Students who received one matriculation service or one exemption are not included in the study. In order to answer the study questions, the following five data sets were examined.[4]

| DATABASE OR EXTRACT | DESCRIPTION | NUMBER STUDENTS (Unduplicated) |
|---|---|---|
| CAPP Database | Students who took one of three placement tests between April '95 and September '95 | 7,002 |
| Matriculation Extract | All students who ever received matriculation services, exemptions or waivers | 76,291 |
| Student Extrct | Students enrolled in Fall '95 | 30,090 |
| Grade Extract | Students who have received grades or attempted units in Fall '95 | 30,039 |
| Class | Fall 1995 enrollments with grades and class | 29,481 |

[4] Discrepancies in the databases were found. While the databases share a large set of students, each database has a unique subset of students not found in the other databases. See Spurling study for further information.

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| Extract | drops | |

**RESULTS**

***1. Are the students who are required to go through the matriculation process actually participating in the service?***

Students who are required to go through the matriculation process are those who are either new or re-admitted to City College and have never before gone through matriculation. This study only looks at **new** students. Students were defined as new and included in this study if they met two criteria 1) their admission date was August, 1995; and 2) as of August, 1995, they had been at CCSF for zero terms. The total number of students meeting this definition was 5,955. Because this study uses two or more services to define a matriculated student and two or more exemptions to define exempted student, those participating in one matriculation service or having one exemption were dropped from the study. This includes 627 students, thus, a total of 5,328 students were used as the total to study for this report.

To determine if a student received any of the matriculation services of orientation, counseling, or assessment, the matriculation extract was searched. Students are listed in the matriculation data base when they receive or exempt out of a matriculation service. A total of 1,373 students were not found in the extract (See Table 1.) or more than 23% of the new student population. This finding suggests that a significant number of students did not receive either matriculation services, exemptions or waivers.

Why were so many students either not participating or not getting access to matriculation services? One theory is that many of these students are seeking to enroll in classes during the first two weeks of the term when there is a huge last minute rush to find credit courses throughout the college, and normal matriculation services are overwhelmed. Consequently, many students slip through the process without availing themselves of matriculation services.

**Table 1: Number and Percent of New Students Enrolled in Fall 1995 Receiving or Exempting out of a Matriculation Service** [5]

| New students receiving or exempting out. | | New students not found in the matriculation extract | | Total new students | |
|---|---|---|---|---|---|
| # | % | # | % | # | % |
| 4,582 | 76.9 | 1,373 | 23.1 | 5,955 | 100 |

[5] The matriculation database was used to get these figures.

***2. Do the matriculation services provided improve students' success and/or retention during their first semester of attendance at school?***

To answer this question students who received matriculations services were compared with students who did not receive services. The group that did not receive services includes two types of students: those who exempted out and those who did not participate in the process at all, i.e. they did not exempt out and they did not receive services. We will call this group "non participants." Success was measured by two variables: 1) grade point average (GPA), and 2) the total number of units passed. "Passing" meant that a student received a grade C or better, or received credit when no grades were given.

Retention was also measured by two variables. 1) the number of dropped classes (student withdraws from a class early in the term and therefore the withdrawal is not included in the student's transcript and carries no penalty), and 2) a withdrawal later in the term--in this case the withdrawal remains on the student's transcript. The withdrawal on the transcript does not affect GPA but doesn't look good, and a student with too many "W's" can ultimately be placed on probation. Therefore, this study considers the late term withdrawal as carrying a penalty.

Table 2 shows that when comparing all matriculated students with all non-participants students in this study, differences are found between the two groups. Matriculated students,

- enroll in more units,
- take more units,
- pass more units, and
- drop more units both without penalty and with penalty,
- achieve slightly lower GPAs then non-participant students

**TABLE 2: Matriculated and Non Participant Students Compared by Number of Units Taken, Number of Units Passed, Number of Units Dropped With and Without a Penalty, and GPA**

| Type of Student | # units enrolled in | # units taken | # units passed | # units dropped--no penalty | # units dropped with penalty | GPA |
|---|---|---|---|---|---|---|
| Matriculated | 12.01 | 9.73 | 9.56 | 3.02 | 1.54 | 2.41 |
| Non-Participant | 5.75 | 5.09 | 5.00 | 1.14 | 1.03 | 2.59 |

However, since the matriculated and non-participant groups are quite diverse in their receipt of educational services, they were broken down into eight groups paired into four sets of corresponding cohorts in order to compare students based only on their receipt of matriculation services. The student groups were organized on the following criteria:

1) the number of units taken,
2) the number of matriculation services received, and
3) the number of exemptions received.

Table 3 indicates the number of people in the various categories.

**TABLE 3: Assignment of Students to Group Based on Units Taken, Matriculation Services Received, and Exemptions Received.**

| Group | Number of units taken | Number of matric. services | Number of Exemptions | Number of students | |
|---|---|---|---|---|---|
| 1 | more than 9 | 2 or more | fewer than 2 | 1278 | |
| 2 | more than 9 | none | none | 232 | |
| 3 | 9 or fewer | 2 or more | fewer than 2 | 1255 | |
| 4 | 9 or fewer | none | none | 1131 | |
| 5 | more than 9 | 2 or more | exempt 2 + | 10 | * |
| 6 | more than 9 | none | exempt 2 + | 70 | |
| 7 | 9 or fewer | 2 or more | exempt 2 + | 29 | |
| 8 | 9 or fewer | none | exempt 2 + | 1323 | |
| ALL | | | | 5328 | |

*This group has a very small sample size and should be taken into account when drawing conclusions.

Even within the paired groups (i.e. Group 1 compared to Group 2, etc.), the matriculated groups enroll in and take more units. Since enrolling in and taking more classes would have an effect on units dropped and/or units passed, a statistical method had to be applied to make the eight groups comparable. An Analysis of Variance (ANOVA) was used to control for irrelevant differences[6].

Further comparisons were made after the ANOVA was carried out to control for differences. (See Table 4.) Each paired group (i.e. Group 1 with Group 2; Group 3 with Group 4, etc.) was compared to see if there were significant differences between those who received matriculation services and those who did not receive them. When "units enrolled in" are controlled for, no significant differences were found on the variable "units dropped without penalty."

However, when looking at "units dropped with a penalty," significant differences existed. Matriculated students who take more than nine units drop fewer units with penalty than do non-participant students who take more than nine units. This was true whether or not students were exempt. (Groups 1 and 5 drop fewer units than Groups 2 and 6.)

[6] ANOVA or analysis of variance is a test of statistical significance of variance or difference between and within two or more groups.

When "units passed" are examined, significant differences are also found between groups. In this case, the non-participant groups pass fewer units than those who are matriculated. (Groups 2 and 6 pass fewer units than Groups 1 and 5.)

These two results imply that matriculation may have a positive effect on both the success and retention of students. It may not be possible to prove that matriculation makes the difference --it may be that students who go through matriculation are different initially from those who don't. This positive implication, however, is worth further exploration.

**TABLE 4: Adjusted Means of Groups Compared by Units Dropped With and Without Penalty and Units Passed**

| Group description | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Group # | # Units | # matric services | # exemp-tions | Units dropped w/o penalty | Units dropped with penalty | | Units passed | |
| 1 | >9 | ≥2 | >2 | -1.95 | .93 | * | 5.00 | * |
| 2 | >9 | 0 | 0 | -2.16 | 1.76 | * | 4.10 | * |
| 3 | ≤9 | ≥2 | >2 | 3.70 | 1.50 | | 4.29 | |
| 4 | ≤9 | 0 | 0 | 3.74 | 1.29 | | 4.63 | |
| 5 | >9 | ≥2 | ≤2 | -2.36 | -.57 | * | 7.22 | * |
| 6 | >9 | 0 | ≤2 | -1.57 | 1.54 | * | 4.71 | * |
| 7 | ≤9 | ≥2 | ≤2 | 2.94 | .90 | | 5.39 | |
| 8 | ≤9 | 0 | ≤2 | 3.96 | 1.38 | | 4.71 | |

*Significant at the .05 level.

When GPA is examined, statistically significant differences are found. For the group taking nine or fewer units, the non-participating group had a slightly higher GPA. Does this group have more degree holders, or is there another explanation for this difference? In all cases, however, the groups that received matriculation services have smaller standard deviations for GPA than do the non-participant comparison group. This is also true when groups are examined in pairs. Grades are not as dispersed for the matriculated groups as for the non-participant groups. Matriculated students tend to get fewer extreme grades--whether they are A's or F's--than non-participant students. (See Table 5.)

**TABLE 5: Group by Number, Mean and Standard Deviation**

| Group | Number | Mean GPA | Standard Deviation | |
|---|---|---|---|---|
| 1 | 1209 | 2.475 | 1.045 | |
| 2 | 212 | 2.502 | 1.199 | |
| 3 | 798 | 2.300 | 1.349 | * |
| 4 | 777 | 2.542 | 1.444 | |
| 5 | 10 | 3.052 | 0.521 | |
| 6 | 67 | 2.621 | 1.222 | |
| 7 | 25 | 2.742 | 1.212 | |
| 8 | 889 | 2.651 | 1.445 | |

*Significant at the .05 level.

The same type of grade distribution is found when checking the entire extract for all currently enrolled students. Non-participant students get more A's and F's than matriculated students and fewer B's, C's and D's. As mentioned before, non-participant students get more W's. Non-participant students have 20.2 percent W's as compared to 16.1 percent for matriculated students. When all failing grades are examined (D, D-, F, NC, W) for non-participant students, 36.3 percent of their classes have failing grades. For matriculated students failing grades occur in 32.3 percent of their classes. These differences in grade distributions are statistically significant.

What could be causing this interesting difference? Without further research, it is difficult to answer this question. Students who don't go through matriculation can be interviewed to try to help determine the reasons for their lack of participation. Who are these students? Are these the students who already hold degrees, are they more motivated and goal oriented, older and more experienced, more independent? What are the reasons students drop classes? Do students who drop classes late in the term do it because they don't know (since they didn't go through matriculation) that dropping a class late in the term goes on your record, or do they not care?

One possible explanation that could account for most of these differences is that participating in matriculation services helps students enter a class that fits their ability. This would explain why fewer matriculated students drop out (they have selected the correct class) and why more matriculated students get average grades (the classes they have selected are neither too easy, nor too difficult). If this is the case, it may be that matriculation services would be useful for all students in so far as helping them to identify the correct classes in which to enroll. Understanding who does not need matriculation services in order to be successful and who can be helped by matriculation would make for a more cost-effective system both for the college and the individual student.

3. ***Do the students who receive matriculation services differ in gender, age or ethnic identity from those who don't receive the services?***

Since it appears that matriculation services may have an effect on retention and success, it is important to know if students of different ages, genders and ethnicities receive these services equally. This matter was addressed by looking at cross tabulations of membership in a matriculated (served) group versus non-participating (not served) group with 1) gender, and 2) ethnic identity. An ANOVA was used to determine whether groups differed significantly in age.

Gender

No significant differences exist between males and females in the receipt of matriculation services. Males and females receive matriculation services in roughly equal proportion.

**TABLE 6: Matriculation Status by Student Gender**

| Matriculation Status | Female | Male |
|---|---|---|
| Matriculated | 1,488<br>52.6% | 1,259<br>50.9% |
| Not Matriculated | 1,343<br>47.4% | 1,215<br>49.1% |

Age

On the other hand, age is found to be significantly related to the receipt of matriculation services. The mean difference between matriculated and non-participating groups is seven years. Non-participating students are on average 31 years old while matriculated students average age is 24. This is not surprising since older students are more experienced in general and may not feel they need as much guidance. Older students may more readily meet the requirements for exempting out of matriculation services. For example, more of them may have degrees.

**TABLE 7: Matriculation Status Students by Mean Student Age**

| Matriculation Status | Number Students | Mean Age |
|---|---|---|
| Matriculated | 2,508 | 23.9 |
| Non-participating | 2,699 | 30.8 |

Ethnicity or Race

This study found that much larger percentages of certain groups receive matriculation services than others. Those groups who receive more matriculation services are Vietnamese, Chinese, Central American, and Filipino. Smaller percentages of African American, Other Hispanic, and White students receive matriculation services.

**TABLE 8: Ethnic or Racial Group by Matriculation Services & Ranked According to Percent of Group Served**

| Ethnic or Racial Group | Non-Participating | Matriculated | Rank of % Served |
|---|---|---|---|
| African American | 242 | 196 | 6 |
| | 55.3% | 44.7% | |
| Central American | 64 | 117 | 3 |
| | 35.4% | 64.6% | |
| Chinese | 273 | 612 | 2 |
| | 30.8% | 69.2% | |
| Filipino | 173 | 312 | 4 |
| | 35.7% | 64.3% | |
| Mexican | 151 | 128 | 5 |
| | 54.1% | 45.9% | |
| Other Hispanic/Latino | 100 | 76 | 7 |
| | 56.8% | 43.2% | |
| Vietnamese | 27 | 94 | 1 |
| | 22.3% | 77.7% | |
| White | 1203 | 609 | 8 |
| | 66.4% | 33.6% | |

There are a variety of interpretations of why certain ethnic groups take advantage of matriculation services in larger numbers than others. One view proposes that immigrant students seek matriculation services more often because they perceive that they need additional guidance to get through institutional obstacles. Another view suggests that a greater percentage of African-American, Latino and white students enroll in classes just before the beginning of the semester and consequently, slip through the matriculation requirements.

Is there any relationship between ethnicity and full or part time status? Is it possible that there are more Asian students taking nine or more units and therefore avail themselves more often of matriculation services? The study reveals that while the percentages of full time students who receive matriculation services is up for all ethnic and racial groups taking more than nine units, the percentages still differ markedly by group. Roughly three fourths of Mexicans, other Hispanic/Latinos, Whites and African American receive matriculation services. For the Asian groups the numbers are closer to 90 percent.

**TABLE 9: Ethnic or Racial Group by Matriculation Services Received for Students Taking More than Nine Units**

| Ethnic or Racial Group | Non-Participating | Matriculated | Rank of % Served |
|---|---|---|---|
| African American | 35<br>30.2% | 81<br>69.8% | 8 |
| Central American | 6<br>12.8% | 41<br>87.2% | 3 |
| Chinese | 34<br>8.1% | 384<br>91.9% | 1 |
| Filipino | 29<br>15.3% | 160<br>84.7% | 4 |
| Mexican | 17<br>25.8% | 49<br>74.2% | 6 |
| Other Hispanic | 7<br>19.4% | 29<br>80.6% | 5 |
| Vietnamese | 6<br>8.8% | 62<br>91.2% | 2 |
| White | 96<br>26.8% | 262<br>73.2% | 7 |

The problem of unequal distribution of matriculation services cannot be simply attributed to the intervening variable of full time status. When the age of matriculated and non-participating students is examined, the study found that younger students are more likely to avail themselves of matriculation services. For full time students (taking nine units or more), the mean age for students receiving matriculation services is 21.9; the mean age for students not receiving matriculation services is 25.2.

Older students and some ethnic or racial groups participate less in the matriculation process, than others. Do older students who receive matriculation services do better (as measured by our success and retention variables) than those older students who don't receive services? Do certain ethnic or racial groups that participate less in the matriculation process do better than those in the same group who do? These questions would have to be answered in another study. If it is found that all groups do better going through matriculation, perhaps it should be more difficult to exempt out.

**FINDINGS**

This study focuses on the participation and effect of matriculation services for students in the Fall 1995 semester at City College of San Francisco. The following summarizes the findings:

1. The study found that more than 23% of the Fall 1995 students were not listed in the matriculation extract. While some students may be participating in matriculation services, but not be listed due to record keeping problems, it is also likely that many of these students are not participating in the process during their first semester because they either choose to avoid the services or are not aware of their existence especially during the first hectic weeks of the semester.

2. Matriculation services were found to have a positive effect on students if they were taking more than nine units. The positive effect is seen in two ways: fewer penalty drops for matriculated students, thus improved retention, and more units passed for matriculated students, thus increased success.

3. Students receiving matriculation services tend to get more "B," "C" and "D" grades and fewer "A," "F," and "W" grades.

4. Non-participating students, on the other hand, have more grade extremes, that is, they have more "A" and "F" grades.

5. Less predictable was the finding that students who took nine or fewer units and did not receive matriculation services had a higher GPA than those who did receive services.

6. The positive result of participating in matriculation may be that students end up taking classes that fit their level of ability; this would account for some of the differences found between the groups.

7. Student age is significantly related to whether a student received matriculation services. It is more likely for younger students to receive matriculation services than older students.

8. No significant differences were found between male and female students receiving matriculation services

9. Finally, significant differences were also found among racial and ethnic groups. More than 90% of Chinese and Vietnamese students who enrolled with more than 9 credit units participated in matriculation services while less than 74% of similarly enrolled white and African-American students participated in these services.

## IMPLICATIONS AND NEXT STEPS

This initial study suggests that matriculation services do make a difference in students' experience at City College. Matriculating students, those who participated in two or more matriculation activities and enrolling in nine units or more, had fewer penalty drops, improved retention and thus increased success.

> *A follow-up study of Fall 1996 matriculating and non-participating students would help to determine the validity of this study's findings. A review of findings from other community colleges on the impact of matriculation services on student success would also be valuable.*

Non-participating students have more grade extremes, that is, they have more "A" and "F" grades.

> *Why these results occur may have something to do with matriculation helping students to identify the appropriate level of class. Initial differences between the groups rather than the effect of matriculation may also account for some of these differences. Further research comparing other background variables such as prior years of education and interviewing students might help to clarify the reasons for these results.*

A significant number of students, more than 23% of the Fall 1995 students, did not participate in the matriculation process, i.e. they received no services or exemptions.

> *Additional studies should be conducted to find out why they are not participating in matriculation activities. While she was Dean of Matriculation and Assessment, Jean McTyre developed specific recommendations regarding these missing students. They include:*

- *Require that the proper matriculation documents accompany all admission applications. This will help ensure that students who do not wish to participate in the matriculation process and can meet the exemption requirements have completed the appropriate documents. This information must also be recorded on the matriculation database.*

- *Send a follow-up notice to all new students who are not included on the matriculation database. The notice will include information about the matriculation services with a schedule of dates to complete the services. This is being planned with the implementation of the new Banner system.*

- *Review the data collection and data entry activities at all campuses to ensure that all necessary information is being recorded for all students.*

Significant differences appear to exist among different ethnic and racial groups as to participation in matriculation services.

> *Follow-up studies should be conducted with students from groups underrepresented in matriculation services to find out why they are not using the services.*

Additional questions remain about student progress and success through the key gateway programs in Mathematics, English and English as a Second Language. To address these questions, the Offices of Matriculation/Assessment and Research/Planning contracted with Dr. Steven Spurling to produce a series of three studies on student progress and success in the Math, English and ESL course sequences. These studies were completed during the Spring and Fall 1997 and will be available as reports later in the Spring or Fall 1998 semester.